

REMARKS

Applicants request favorable consideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Claims 13 and 15-25 are presented for consideration. Claim 13 is the sole independent claim. Claim 14 has been canceled without prejudice or disclaimer. Claims 13, 15, 16 and 18-22 have been amended to clarify features of the subject invention. Support for these changes can be found in the original application, as filed. Accordingly, no new matter has been added.

Applicants request favorable reconsideration and withdrawal of the rejections set forth in the above-noted Office Action.

Claims 13, 14, 17 and 18 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,633,887 to Bechthold. Claim 24 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Bechthold patent as applied above to claim 13. Claims 15, 16, 19 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Bechthold patent as applied above to claim 13, and further in view of U.S. Patent No. 4,779,547 to Zugner. Claims 23 and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Bechthold patent as applied above to claim 13, and further in view of U.S. Patent No. 4,748,916 to Nordh. Claims 21 and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Bechthold patent as applied above to claim 13, and further in view of U.S. Patent No. 3,921,913 to Capy, and even further in view of the Nordh patent. Applicants submit that the cited art, whether taken individually or in combination, does not teach or suggest many features of the present invention, as previously recited in these claims. Therefore, these rejections are respectfully traversed. Nevertheless, Applicants submit that independent claim 13, for example, as presented, amplifies the distinctions between the present invention and the cited art.

Independent claim 13 recites a nozzle arrangement for guiding fluidizing gas to a fluidized bed gasifier or combustor. The nozzle arrangement includes a nozzle piece attached to a nozzle tube or forming a structural unit with a nozzle tube. The nozzle piece includes (i) a nozzle chamber, (ii) a horizontally extending nozzle channel in flow communication with the nozzle chamber, and (iii) a blow opening at the end of the nozzle piece. The blow opening directs fluidizing gas being blown through the nozzle chamber and the nozzle channel into the fluidized bed gasifier or combustor. The nozzle arrangement further includes an impervious lid for defining an upper limit of the nozzle chamber, the nozzle channel and the blow opening, and a protecting cover attached above and spaced apart from the lid, for minimizing cooling of the outer surface of the nozzle piece due to the fluidizing gas being blown through the nozzle piece into the fluidized bed gasifier or combustor.

The inventors of the subject invention have observed that, if the temperature of the upper parts of the grid nozzles of a fluidized bed gasifier or combustor reaches between about 450°C and about 600°C, the nozzles may be corroded by salts formed by alkalis. In a conventional grid nozzle with a horizontally extending nozzle channel, the fluidizing gas flowing in the channel tends to cool the upper surface of the lid of the nozzle channel to the above-mentioned critical temperature range. Applicants' present invention, therefore, seeks to minimize cooling of the outer surface of the nozzle piece caused by fluidizing gas being blown through the nozzle arrangement. Applicants' invention, as recited in independent claim 13, does this by arranging a protecting cover above the lid.

Applicants submit that the cited art does not teach or suggest such features of Applicants' present invention, as recited in independent claim 13.

The Bechthold patent relates to a method of and an apparatus for direct heating of a fluidized bed and vortex-layer reactors in which a nozzle grid is provided with a plurality of uniformly spaced coaxial tube members. One of the chambers of the grid is supplied with air, while the other is supplied with liquid (hydrocarbon fuel) within the members. An impingement-type atomizing surface is provided, at which the liquid is atomized and mixed with the air just as the mixture enters the reactor.

FIG. 2 of the Bechthold patent shows a nozzle for feeding oxygen-containing gas (air) from a duct 20 and the liquid fuel through a lateral opening 30 into the fluidized bed reactor. In order to prevent build up of excessive temperatures of the upper body 22a of the nozzle and, thereby, to preclude thermal transformation of the thermally unstable liquid fuel, cooling air is conducted through pipes 31 from the duct 20 to a narrow gap, cooling passage 36, between the upper body 22a and a disc 33 fixed up above the upper body 22a. The purpose of the disc 33, pipes 31 and the cooling passage 36 in that patent is thus to provide cooling for the upper body 22a. Applicants submit that one having ordinary skill in the art would recognize that, at the same time, the top of the disc 33 cools to a temperature that is close to that which the top of the upper body 22a would have without the cooling.

Applicants submit, therefore, that the arrangement suggested in the Bechthold patent provides additional cooling to the upper part of the nozzle, whereas the goal of Applicant's invention is the opposite: to prevent cooling of the upper portion of the nozzle. Accordingly, Applicants submit that the arrangement shown in FIG. 2, for example, of the Bechthold patent does not teach or suggest the arrangement of the nozzle, the impervious lid and the protecting cover of Applicants' present invention, as recited in independent claim 13. Applicants submit,

therefore, that the Bechthold patent should not be read to anticipate or render obvious Applicants' present invention, as recited in independent claim 13.

Applicants further submit that the remaining art cited does not cure the deficiencies noted above with respect to the Bechthold patent.

The Examiner relies on the Zugner patent for showing a nozzle with a lid 13 and a protecting cover (wear resisting ring 14 and refractory concrete 15), wherein the protecting cover includes a cover plate and ribs. The Examiner relies on the Nordh patent for teaching an air nozzle that that can be made from ceramic material. The Examiner relies on the Capy for teaching a gas burner with an inclined part 17 on a ceramic part 11 arranged at a blow opening end of a nozzle channel for forming a rising gas flow at the front of the blow opening.

Applicants submit, however, that the none of the remaining art cited teaches or suggests the arrangement of the nozzle piece, the impervious lid and the protecting cover of Applicants' present invention, as recited in independent claim 13. Applicants submit, therefore, that the remaining art cited does not cure the deficiencies noted above with respect to the Bechthold patent.


For the foregoing reasons, Applicants submits that the present invention, as recited in independent claim 13, is patentably defined over the cited art, whether that art is taken individually or in combination.

Dependent claims 15-25 also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in independent claim 13. Applicants request further individual consideration of these dependent claims.

Applicants submit that the instant application is in condition for allowance. Applicants request, therefore, favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action, and an early Notice of Allowance.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Steven E. Warner", is written over a horizontal line.

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